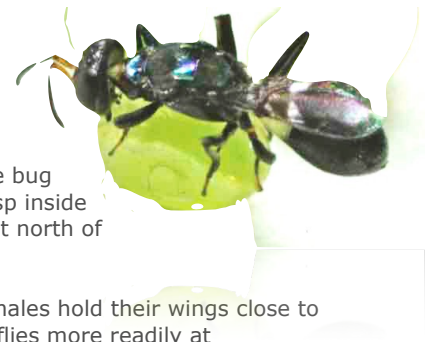


Anastatus wasps

Egg Parasitoid of fruitspotting bugs



About Anastatus

Anastatus is an egg parasitoid of fruitspotting bugs (FSB and BSB). That is, it uses the bug egg to rear its own young. It takes three weeks to a month to develop to an adult wasp inside a bug egg. Anastatus is commonly found in Queensland (I found it in my backyard just north of Brisbane) and its also found in Northern NSW.

The female Anastatus wasp is about 4 mm long and could be mistaken for an ant. Females hold their wings close to their body and is constantly walking across leaves but unlike ants it hops and flies. It flies more readily at temperatures over 23 degrees. Females may live for over a month but do most of their parasitising in the first three weeks and they may travel hundred of meters in that time. The males are much smaller and more wasp like. Males and females feed on nectars and insect honey dews.

The release strategy

By making releases of Anastatus we aim to increase the local wasp numbers and subsequently reduce locally breeding bug populations and so their migration into your crops. We are targeting the warmer months from early spring to reduce summer bug activity and through to late autumn to reduce numbers of overwintering bugs.

We have strong signs that Anastatus can make a very useful contribution to reducing bug numbers and damage. About 25 farms to date show big reductions in bug damage and another 30+ sites have a moderate reduction. It may take several seasons to get the full benefit and it's likely they will work better and faster at some sites than others.

We therefore suggest that you continue your normal practices for controlling bugs and do not reduce your spraying until its deemed that bug numbers in your crop are low enough to do so. We recommend checking the crop for active bugs or fresh bug damage before spraying. The first step with the strategy is to reduce bug damage then if possible to reduce spraying and in turn you will get some help from other natural enemies of FSB like spiders.

The release cards

The cards contain unviable silkworm eggs that have been parasitised by Anastatus. The wasps are likely to emerge soon after you receive the parcel and will continue to emerge for another week or so. Some may be out when you receive the parcel. In cool weather they are slower to emerge.

The parasitism and emergence rates will vary from batch to batch. Typically expect 30% to 60% of the eggs on the cards to yield wasps, that is, escape holes evident after a week or so. We check the parasitism rate and calculate the emergence and send you the appropriate number of cards each week. This means you will get from 2 to 6 cards per 1,000 wasps ordered depending on parasitism and emergence rates.

Upon arrival

Open the plastic bag and puff in some fresh air and reseal. Keep the bag in a warm place but out of direct sunlight. Its desirable to wait until some (say 50) of the wasps have emerged in the bag before placing the cards in the field, otherwise the cooler overnight conditions will stall emergence. The wasps will need some food like honey within a couple of days of emerging, so don't keep them in the bag too long. You can put a couple of drops of honey in bag.

Placing in the field

The cards can be torn into groups of 3 or 6 strips and stapled under a leaf or around a small branch with the eggs on the inside. This gives some protection from direct sun and rain. In very wet areas, you can hang them from a wire in an upside down container to protect the eggs as wasps will continue to emerge for a week or more. Two litre milk cartons are ideal with a piece of wire passed through to hook the cards on.



Some growers who have a lot of trouble with predators eating the silkworm eggs, have put the cards on arrival into several bags and allow the wasps to emerge in the bags. Then, every day or two let them go in the field.

- In hot weather, do not place the cards with eggs in direct sun as this will kill the developing wasps.
- In cool weather, less than 20°C max, place cards where they get warmth during the day so some direct sun is okay.
- Try and place the cards as close as practical to areas or trees where bugs are likely to be breeding - along boundaries and around the farm.
- You can place cards in the crop when bugs are present if you are not anticipating spraying in near future, or in adjacent properties. Seek permission from neighbours where appropriate.

This table summarises the major FSB and BSB hosts, exotic (X) and native (n) species. FSB is found in northern coastal NSW while both FSB and BSB are found in Qld. FSB feeds on fruits and BSB feeds on fruits and shoots or new growth of many plants. F&B stands for - feeds & breeds. These bugs feed on, but don't breed well on, a wider range of plants. This list is sorted by common name.

This table has been derived from the one published by Waite et al* in 2000. HAL Final Report HG97010 Ecology and Behaviour of fruitspotting bugs

Family	Scientific name	Common name	Origin	FSB	BSB
LAURACEAE	<i>Persea americana</i>	avocado	x	F&B	F&B
MUSACEAE	<i>Musa paradisiaca</i>	banana	x		F&B
ARECACEAE	<i>Archontophoenix cunninghamiana</i>	Bangalow palm	n		F&B
CAESALPINDACEAE	<i>Bauhinia variegata</i>	bauhinia	x	F&B	F&B
CAESALPINDACEAE	<i>Bauhinia galpinii</i>	bauhinia	x	F&B	F&B
SAPINDACEAE	<i>Alectryon coriaceus</i>	beach bird's eye	n		F&B
ARECACEAE	<i>Livisona sp.</i>	cabbage palm	x		F&B
THEACEAE	<i>Camellia japonica</i>	camellia	x		F&B
LAURACEAE	<i>Cinnamomum camphora</i>	camphor laurel	x	F&B?	?
OXALIDACEAE	<i>Averrhoa carambola</i>	carambolla	x	F&B	F&B
CAESALPINDACEAE	<i>Ceratonia siliqua</i>	carob	x		F&B
ANACARDIACEAE	<i>Anacardium occidentale</i>	cashew nut	x		F&B
EUPHORBIACEAE	<i>Ricinis communis</i>	castor bean	x		F&B
MAGNOLIACEAE	<i>Michelia champaca</i>	champak	x	F&B	F&B
EUPHORBIACEAE	<i>Glochindion ferdinandi</i>	cheese tree	n		F&B
CUCURBITACEAE	<i>Sechium edule</i>	choko	x		F&B
MORACEAE	<i>Ficus carica</i>	common fig	x	F&B	
FABACEAE	<i>Erythrina crista-galli</i>	coral tree	x		F&B
PASSIFLORACEAE	<i>Passiflora suberosa</i>	corky passion flower	x	F&B	F&B
MALVACEAE	<i>Hibiscus tiliaceus</i>	cotton tree	n		F&B
ANNONACEAE	<i>Annona reticulata</i>	custard apple	x	F&B	F&B
VITIACEAE	<i>Vitis vinifera</i>	grape	x	F&B	F&B
PASSIFLORACEAE	<i>Passiflora quadrangularis</i>	grenadilla	x		F&B
MYRTACEA	<i>Psidium guajava</i>	guava	x	F&B	F&B
ROSACEAE	<i>Raphiolepis indica</i>	Indian hawthorn	x	F&B	
MYRTACEA	<i>Myrciaria cauliflora</i>	jaboticaba	x	F&B	
ASTERACEAE	<i>Lactuca sativa</i>	lettuce	x		F&B
MYRTACEA	<i>Syzygium sp.</i>	lillypilly	n	F&B	F&B
SAPINDACEAE	<i>Dimocarpus longan</i>	longan	x	F&B	F&B
ROSACEAE	<i>Eriobotrya japonica</i>	loquat	x	F&B	F&B
SAPINDACEAE	<i>Litchi chinensis</i>	lychee	x	F&B	F&B
PROTEACEAE	<i>Macadamia integrifolia</i>	macadamia nut	n	F&B	F&B
PROTEACEAE	<i>Macadamia tetraphylla</i>	macadamia nut	n	F&B	F&B
ANACARDIACEAE	<i>Magifera indica</i>	mango	x	F&B	F&B
RUTACEAE	<i>Citrus mayeri</i>	Meyer lemon	x		F&B
ARALIACEAE	<i>Schefflera arboricola</i>	mini umbrella tree	x		F&B
RUTACEAE	<i>Murraya paniculata</i>	mock orange	x	F&B	F&B
MORACEAE	<i>Morus nigra</i>	mulberry	x	F&B	F&B
CARICACEAE	<i>Carica papaya</i>	papaw	x	F&B	F&B
PASSIFLORACEAE	<i>Passiflora edulis</i>	passion fruit	x	F&B	F&B
PUNICACEAE	<i>Punica granatum</i>	pomegranate	x		F&B
ROSACEAE	<i>Rubus indaeus</i>	raspberry	x	F&B	
ANACARDIACEAE	<i>Euroschinus falcatus</i>	ribbonwood	n	F&B	F&B
ROSACEAE	<i>Rosa spp.</i>	rose	x		F&B
MORACEAE	<i>Ficus racemosa</i>	rough-leafed fig	n	F&B	F&B
ELAEOCARPEACEAE	<i>Elaeocarpus grandis</i>	silver quandong	n	F&B	
FABACEAE	<i>Phaseolus atropurpureus</i>	Siratro	x	F&B	F&B
RHAMNACEAE	<i>Alphitonia petrei</i>	soap bush	n	F&B	F&B
ROSACEAE	<i>Fragaria x ananassa</i>	strawberry	x	F&B	
SAPINDACEAE	<i>Cupaniopsis anacardioides</i>	tucheroo	n		F&B
MELIACEAE	<i>Melia azedarach</i>	white cedar	x	F&B	F&B
RUTACEAE	<i>Casimiroa edullis</i>	white sapote	x	F&B	F&B
EUPHORBIACEAE	<i>Pedilanthus tithymaloides</i>	zigzag plant	x		F&B